BEFORE THE UNITED STATES PATENT AND TRADEMARK OFFICE BOARD OF APPEALS AND INTERFERENCES

In re Application of: **Gregory S. Francis et al.** Serial No. 09/910,669 Filed: July 20, 2001 For: MULTIFUNCTION DISPLAY DESIGN TOOL	Examiner: Zhou, Ting Group Art Unit: 2173 November 6, 2007

APPEAL BRIEF

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

The present appeal is taken from the March 7, 2007 official action rejecting claims 1-8, 10-17 and 19-28. The claims on appeal appear in the attached APPENDIX.

I. REAL PARTY IN INTEREST

The real party in interest in the United States Government, as represented by the Secretary of the Army.

II. RELATED APPEALS AND INTERFERENCES

Appellants are unaware of any other appeals or interferences which will directly affect or by directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-8, 10-17 and 19-28 are being appealed. Claims 1-8, 10-17 and 19-28 are rejected and 9 and 18 are objected to.

Claims 19 thru 27 are rejected under 35 U.S.C. §101 for claiming non-statutory subject matter.

Claims 1-5, 8, 10-14, 17, 19-23, 26 and 28 stand rejected under 35 U.S.C. §103 as being unpatentable over *Wagner et al.* (U.S. Patent 6,002,395) hereinafter "*Wagner*" in view of *Lynch et al.* (U.S. Patent 5,835,693) hereinafter "Lynch".

Claims 6-7, 15-16, and 24-25 stand rejected under 35 U.S.C. §103 as being unpatentable over *Wagner et al.* (U.S. Patent 6,002,395) in view of *Lynch et al.* (U.S. Patent 5,835,693) and further in view of *Ikemoto* (U.S. Patent 5,969,717).

IV. STATUS OF AMENDMENTS

There are currently no pending amendments.

V. SUMMARY OF THE INVENTION

The presently claimed device is described at page 4, line 31 through page 5, line 26 of the specification as filed (Paragraphs 19-22 of the published application).

Disclosed and claimed is a method, apparatus and related system for the automated assignment of buttons and labels across one or more displayed pages in response to input quantitatively specifying design constraints and tradeoffs. Specifically the invention disclosed is a design tool for efficiently designing multi-function displays. The design tool, embodied in the disclosed methods, apparatus and systems, allows an interface designer to define and prioritize various design considerations for the layout of one or more displayed pages on a desired user interface (e.g. a touch screen display on a kiosk), and based on the designers input will automatically assign buttons (sizes and/or position), and labels across one or more displayed pages. The designer provides input into the system through touch screens, light pen, GUI or etc.

The design tool allows a designer (user) to rank various variables and the tool will automatically optimize the button, label and screen layout. Variables that a designer may rank include an end users muscle memory, repetitive motions/keystrokes, the relationships of screens relating to a task, including the information needed by a potential end user of the interface for a follow up keystrokes to accomplish a task etc. The design tool processes this information and determines the most efficient layout for a multi-function display in view of the designer's priorities. Other considerations that may be considered are; the time critical nature of a function, the number of levels in hierarchy relating to a particular task, the relationship of the functions, and the types of errors that one may make and how to minimize the

effect of an accidental keystroke. (*See* ¶ 98 -109 of the published application or pg. 21, lns. 21-47 of the specification as filed).

The disclosed methods and systems use relationships that are defined and "ranked" or "weighted" by the designer as "constraints" that can be imposed on different defined interactions. Some of these interactions are "Global difficulty", "Pages to close buttons", "Pages to fixed buttons", "Path difficulty", "Pages to far buttons", and "Parent to child variability". (*See* ¶ 112-118 of the published application or pg. 22 ln. 1-pg. 24, ln. 10 of the specification as filed).

"Global difficulty" is associating page labels and buttons in a way to minimize the average difficulty needed to reach information. (See¶ 113 pub. or pg. 22, ln 35 – pg. 23, ln. 4 spec.).

"Pages to close buttons" allow one to consistently associate labels and button groupings to related labels on the same or subsequent screens. (*See* ¶ 114 pub. or pg. 23, lns. 5-14 spec.).

"Pages to fixed buttons" is restricting a single label or multiple labels (either on the same or subsequent screens) to a subset of possible buttons. (*See* ¶ 115 pub. or pg. 23, lns. 15-22 spec.).

"Path difficulty" considers the button sequences across various screens necessary to accomplish a particular task and allows a designer to identify these paths and assign button positions to minimize the difficulty in accomplishing that task. (*See* ¶ 116 pub. or pg. 23, lns. 25-37).

"Pages to far buttons" allows one to separate a set of labels or buttons to avoid confusion of similar labels or buttons that may be functionally different. (*See* ¶117 pub. or pg. 23, lns. 38-44 spec.).

"Parent to child variability" minimizes the variability in interaction coefficients between the buttons assigned to a page's parent and to itself. An example would be the distance between assigned buttons on subsequent pages. A keystroke for similar task on parent and child pages should be of a similar distance/reach requiring similar motions. (*See* ¶ 118 pub. or pg. 23, lns. 46-56 spec.).

Each constraint has a corresponding "cost" function that measure how well a constraint is being satisfied by the current multi-function display design. Smaller cost values correspond to better designs relative to that particular constraint. (*See* ¶ 119 pub. or pg. 24, lns. 1-9 spec.).

The design tool allows a designer to input information regarding the geometrical arrangement of the buttons on the display, the labeling, the interaction between the buttons as well as the cost constraints. The designer provides input into the system through touch screens, light pen, GUI or etc. The design tool then automatically calculates the constraint cost value and assigns the labels and buttons optimizing the multi-function display layout based on the designer's input. (*See* ¶ 64 pub. or pg. 11, lns. 1-14 spec.).

VI(A). The Subject Matter of Independent Claim 1

The present invention is exemplified by independent claim 1 which defines a method including the steps of accepting user input specifying a geometrical arrangement of two or more buttons on one or more displayed pages and accepting user input labeling at least two of the two or more buttons on the one or more displayed pages. (*See* Fig. 1. fn 102, 104 and Fig. 2. fn 102, 104)
The method of claim 1 also includes accepting user input defining at least one interaction between the labeled at least two buttons and accepting user input specifying at least one constraint cost for the defined at least one interaction. (*See* Fig. 1. fn 106 and Fig. 2. fn 106, see also ¶63 pub. or pg. 10, ln. 33- pg. 11, ln. 6 spec.).

Based on this user input the design tool calculates at least one constraint cost value corresponding, respectively, to the at least one constraint cost. The design tool then automatically assigns the labels of the at least two buttons among the two or more buttons on one or more displayed pages such that the at least one constraint cost is substantially optimized and the at least one constraint cost value is indicative of a relative optimization of the at least one constraint cost. (*See* Figs. 1-4, fns. 106, 108, 110 see also ¶¶ 64, 65 pub. or pg. 11, lns. 7- 23 spec.).

VII(B). The Subject Matter of Independent Claim 10

While claim 1 exemplifies the present invention in connection with method

for creating optimized designs for multi-function displays, claim 10 generally corresponds to claim 1 and exemplifies the present invention of a multi function design tool in the form of a system that receives designer input regarding the button and screen layout of a multi-function display and automatically optimized the button and screen layout.

System claim 10 recites circuitry for accepting user input specifying a geometrical arrangement of two or more buttons on one or more displayed pages. The circuitry for the system is selected from an electrical-circuitry group including electrical circuitry having at least one discrete electrical circuit, electrical circuitry having at least one integrated circuit, electrical circuitry having at least one application specific integrated circuit, electrical circuitry forming a general purpose computing device configured by a computer program, electrical circuitry forming a memory device, and electrical circuitry forming a communications device. Claim 10 further recites circuitry for accepting user input labeling at least two of the two or more buttons on the one or more displayed pages as well as circuitry for accepting user input defining at least one interaction between the labeled at least two buttons. (*See* Fig. 8, see also ¶¶ 72, 73 pub. or pg. 14, lns. 7- pg. 15, ln. 13 spec.).

Claim 10 also features circuitry for accepting user input specifying at least one constraint cost for the defined at least one interaction and circuitry for

calculating at least one constraint cost value corresponding, respectively, to the at least one constraint cost.

Claim 10 also recites circuitry for automatically assigning the labels of the at least two buttons among the two or more buttons on one or more displayed pages such that the at least one constraint cost is substantially optimized and the at least one constraint cost value is indicative of a relative optimization of the at least one constraint cost. (*See* Fig. 8, see also ¶¶ 72, 73 pub. or pg. 14, lns. 7- pg. 15, ln. 13 spec.).

VIII(C). The Subject Matter of Independent Claim 19

Claim 19 is another system claim and recites means for accepting user input specifying a geometrical arrangement of two or more buttons on one or more displayed pages as well as means for accepting user input labeling at least two of the two or more buttons on the one or more displayed pages. (*See* Figs. 7, 8, see also ¶¶ 61, 72, 74 pub. or pg. 14, lns. 7- pg. 15, ln. 23 spec.).

Claim 19 also features means for accepting user input defining at least one interaction between the labeled at least two buttons and means for accepting user input specifying at least one constraint cost for the defined at least one interaction as well as means for calculating at least one constraint cost value corresponding,

respectively, to the at least one constraint cost. (*See* Figs. 7, 8, see also ¶¶ 63, 64, 73 pub. or pg. 10, lns. 32- pg. 11, ln. 15, pg. 14, lns. 35- pg. 15, ln. 14 spec.).

Claim 19 recites means for automatically assigning the labels of the at least two buttons among the two or more buttons on one or more displayed pages such that the at least one constraint cost is substantially optimized and the at least one constraint cost value is indicative of a relative optimization of the at least one constraint cost. (*See* Figs. 7, 8, see also ¶¶ 65, 67, 71-73 pub. or pgs. 11, lns. 15-22, pg. 12, lns. 3-15, pg. 13, ln. 24- pg. 15, ln. 13 spec.).

Means for accepting user input may be a touch screen, light pen, GUI or voice activation, among other things. (*See* Figs. 7, 8, see also ¶, 67 pub. or pg. 12, lns. 3-15 spec.).

V(D). The Subject Matter of Independent Claim 28

While claim 1 exemplifies the present invention in connection with a method for creating optimized designs for multi-function displays, claim 28 generally corresponds to claim 1 and exemplifies the present invention of a multi function design tool in the form of a computer program product. (*See* Figs. 7, see also ¶¶, 72-86 pub. or pg. 14, lns. 7-pg. 18, ln. 18 spec.).

Claim 28 recites a computer program product including a computer readable program executed on a computer that causes the computer to accept user input specifying a geometrical arrangement of two or more buttons on one or

more displayed pages and to accept user input labeling at least two of the two or more buttons on the one or more displayed pages.

The computer readable program product of Claim 28 also causes the computer to accept user input defining at least one interaction between the labeled at least two buttons and accept user input specifying at least one constraint cost for the defined at least one interaction. Claim 28 also requires the computer to calculate at least one constraint cost value corresponding, respectively, to the at least one constraint cost and automatically assign the labels of the at least two buttons among the two or more buttons on one or more displayed pages such that the at least one constraint cost is substantially optimized and the at least one constraint cost value is indicative of a relative optimization of the at least one constraint cost.

VI. GROUNDS OF REJECTION T BE REVIEWED ON APPEAL

Appellants respectfully traverse the following grounds of rejection and respectfully present theses ground for review by the Board of Patent Appeals and Interferences:

Claims 19 thru 27 are rejected under 35 U.S.C. §101 for claiming non-statutory subject matter.

Claims 1-5, 8, 10-14, 17, 19-23, 26 and 28 stand rejected under 35 U.S.C. §103 as being unpatentable over *Wagner et al.* (U.S. Patent 6,002,395) in view of

Lynch et al. (U.S. Patent 5,835,693).

Claims 6-7, 15-16, and 24-25 stand rejected under 35 U.S.C. §103 as being unpatentable over *Wagner et al.* (U.S. Patent 6,002,395) in view of *Lynch et al.* (U.S. Patent 5,835,693) and further in view of Ikemoto (U.S. Patent 5,969,717).

VII. ARGUMENT

VII(A). Claims 19 thru 27 define patentable subject matter and the Examiner's rejection of these claims under 35 U.S.C. §101 is in error.

VII(A)1. Claim 19 defines patentable subject matter and the Examiner's rejection of this claim under 35 U.S.C. §101 is in error.

Independent Claim 19 defines patentable subject matter and the Examiner's rejection of this claim under 35 U.S.C. §101 is in error. In his rejection the Examiner states:

> [T]he claimed features and elements of independent claim 19 do not include hardware components or features that are necessarily implemented in hardware. The "system" appears directed to software, per se, lacking any hardware to enable any functionality to be realized; that is, the body of the claim recites "means" for accepting input and calculating values, however, "means" can simply be software, i.e. program code. Therefore, the claimed features of claim 19 is actually software, or at best directed to an arrangement of software,

> and software claimed by itself, without being executed or implemented on a computer medium is not statutory.

It is well settled law that patent claims that involve both a mental process and one of the other categories of statutory subject matter (i.e., a machine, manufacture, or composition) have been held patentable under § 101. *See* AT&T Corp. v. Excel Commc'ns, Inc., 172 F.3d 1352, 1355-1358 (Fed. Cir. 1999) (holding patentable "a process that uses the Boolean principle in order to determine the value of the PIC indicator" and that "require[d] the use of switches and computers"); State St. Bank & Trust Co. v. Signature Fin. Group, Inc., 149 F.3d 1368, 1373 (Fed. Cir. 1998) ("[W]e hold that the transformation of data . . . by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm." (emphases added)); In re Alappat, 33 F.3d 1526, 1544 (Fed. Cir. 1994) (en banc) ("This is not a disembodied mathematical concept which may be characterized as an 'abstract idea,' but rather a specific machine to produce a useful, concrete, and tangible result." (emphases added)); Arrhythmia Research Tech., Inc. v. Corazonix Corp., 958 F.2d 1053, 1058-59 (Fed. Cir. 1992) (holding patentable a method for analyzing electrocardiograph signals for the detection of a specific heart condition that used "electronic equipment programmed to perform mathematical computation").

As presented, claim 19 is in means plus function format. It is also well

settled that claims written in means-plus-function format are construed such that the "means-plus-function language encompasses the structure, material, or acts described in the specification and equivalents thereof." *Sofamore Danek Group, Inc. v. Depuy–Motech, Inc.*, 74 F.3d 1216, 1220 (Fed. Cir. 1996). These concepts are fundamental to any analysis of a patent claim and the application of prior art thereto.

The Examiner chooses to read the recited elements regarding means for accepting user input as software yet the specification states that the operation of "accepting user input" is accomplished via touch screen, light pen, GUI, or Voice Activation etc., thus the means for accepting user input would necessarily be a touch screen, a light pen, GUI or Voice Activation apparatus or an equivalent thereof. As such Appellant respectfully submits that the Examiner's reading of the claim limitations of independent claim 19 as "software" without the benefit of supporting structure to be arbitrary, without merit and clearly contrary to the teachings of the supporting specification.

Appellant respectfully submits that Claim 19 identifies patentable subject matter meeting the requirements of 35 U.S.C § 101, and respectfully request relief from the Examiner's rejection on this basis.

VII(A)2. Dependent Claims 20 thru 27 define patentable subject matter and the Examiner's rejection of these claims under 35 U.S.C. §101 is in error.

Claims 20-27 ultimately depend from independent claim 19, and therefore incorporate all of the elements of the base claim. Appellant respectfully submits that the Examiner's rejection of claims 20-27 is in error. Claims 20-27 similarly define statutory subject matter meeting the requirements of 35 U.S.C § 101, and Appellant respectfully requests relief from the Examiner's rejection on this basis.

VII(B). Claims 1, 10, 19 and 28 are not obvious under 35 U.S.C. §103 and are patentable over *Wagner et al.* in view of *Lynch et al.*.

VII(B)1. The *Wagner* reference.

Wagner discloses a builder, tester and runtime integration and method for a graphical touch user interface, such as a point-of-sale (POS) touch screen interface system. The system and method may include a builder tool to create and modify the graphical interface, at tester tool for testing the interface and a runtime system for executing the interface logic. The builder tool allows a designer to manually build or modify a touch screen interface by manually specifying labels, screens and button placement. *Wagner* does not contemplate automated optimization of a touch screen interface or the ranking of various design aspects.

VII(B)(2). The *Lynch* reference.

Lynch discloses a method and apparatus for the dynamic simulation of a multibody system on a computer. The invention of *Lynch* provides for inputting into the computer a mathematical description of each body in the multibody system, specifying into the computer a force to act on one of the bodies, formulating a Jacobian matrix, solving kinematics constraints in the computer, graphically displaying a result of the solutions of the kinematic constraints from the computer onto and electrical display, whereupon a user can interactively input a change to the multibody system into the computer, and graphically display a result of the change to the multibody system for the computer. The system disclosed in *Lynch* generally deals with dynamic structures or body parts that are acted on by a force. The effect of these dynamic forces on a particular structure is simulated in 3-D on a computer display.

VII(B)3. Claim 1 is not obvious under 35 U.S.C. §103 and is patentable over *Wagner et al.* in view of *Lynch et al.*.

Claim 1 is not obvious under 35 U.S.C. §103, and is patentable over the proposed combination of *Wagner* and *Lynch* because the proposed combination fails to disclose every element recited in claim 1. Specifically, the proposed combination of *Wagner* and *Lynch* fails to teach the claim 1 limitation of "accepting user input specifying at least one constraint cost for the defined at least one interaction." The proposed combination of *Wagner* and *Lynch* also fails to teach the claim 1 limitation of "calculating at least one constraint cost value corresponding, respectively, to the at

least one constraint cost."

The proposed combination further fails to meet the claim limitation of "automatically assigning labels of the at least two buttons among the two or more buttons on one or more displayed pages such that the at least one constraint cost is substantially optimized."

It is well settled that all claim limitations must be taught or suggested; to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *See* In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

The Examiner reads *Wagner* as teaching "means and circuitry" for accepting user input specifying at least one constraint cost for the defined at least one interaction and for automatically assigning labels of the at least two buttons among the two or more buttons on one or more displayed pages such that the at least one constraint cost is substantially optimized, however there is no support for this reading. (See March 7, 2007 Office Action, page 6). The Examiner states that the "parent child relationship between screen and buttons" is a constraint cost contemplated in *Wagner* citing to the various pizza buttons shown in figure 2A being grouped in proximity, however a figure showing arbitrary "pizza" buttons in close proximity does not suggest the optimization of two or more buttons on a plurality of displayed pages

based on a defined constraint cost.

Wagner is devoid of any teaching of the ranking of various cost constraints and automatically arranging similar or dissimilar button multiple screens based on rankings specified by the designer.

The Examiner concludes, conveniently, that *Wagner* inherently teaches automatically arranging the multiple screens for the touch screen display in order to optimize parent/child relationships, interactions of buttons and screen space. Appellant respectfully submits that there is no support for such a reading of *Wagner*. In fact the very problem ignored by *Wagner* is the type of utility addressed by the instant application. *Wagner* requires a designer to manually create the user interface by feel. What feels right.

According to the *Wagner* specification the system and method of building or creating a graphical interface, include the steps of choosing, one-at-a-time, the "controls" that comprise a screen, accessing the menu items and their dialogs to gather the control's information, and saving the dialog information into the object's "slots". This process is repeated for each new screen. (Column 2, lines 21-28)

Appellant's invention automatically creates an interface based on the designers ranking of a plurality design constraints, automatically addressing the tradeoffs that are not taught or contemplated by *Wagner*.

The Examiner concedes that *Wagner* fails to disclose "constraint cost having a corresponding constraint cost value and the at least one constraint cost value is

indicative of an optimization of the at least one constraint cost" and applies *Lynch* as teaching a design, simulation and optimization solution using a graphical user interface similar to that of *Wagner*.

The Examiner further reads *Lynch* as teaching "calculating at least one constraint cost value corresponding to the at least one constraint cost, and at least one constraint cost value is indicative of a relative optimization of the at least one constraint cost," concluding that it would have been obvious for one of ordinary skill in the art, to modify the method of building a graphical interface of *Wagner* to include the use of constraint cost values for optimization taught by Lynch. (See March 7, 2007 Office Action, page 7).

Appellants respectfully submit that this is a misreading and subsequent misapplication Lynch. While *Lynch* does disclose solving kinematic constraints on a computer, *Lynch* is devoid of any discussion or teaching of the optimization of the layout of buttons on a graphical user interface.

Specifically, the kinematic constraints calculated in *Lynch* are employed to graphically display the hinges or joints on a body part of a multi body system to which a force is applied to the body. (See column 2, line 63, thru column 3 line 7, see also column 37, lines 30-67).

The Examiner has supplied no support for his extension of the teachings of the optimization of joint constraints of *Lynch* to the calculation of and use of cost constraints as recited in claim 1, to optimize the assignment of labels and button

arrangement of the instant invention. Appellant respectfully submits that the kinematic constraints calculated in *Lynch* are not applicable to the optimization problem addressed in the instant application.

Appellant respectfully submits that modifying the method of *Wagner* with the teachings of *Lynch* fails to meet the recited claim limitations of "accepting user input specifying at least one constraint cost for the defined at least one interaction" or "calculating at least one constraint cost value corresponding, respectively, to the at least one constraint cost; and automatically assigning the labels of the at least two buttons among the two or more buttons on one or more displayed pages such that the at least one constraint cost is substantially optimized and the at least one constraint cost value is indicative of a relative optimization of the at least one constraint cost."

In view of the forgoing deficiencies in the Examiner's rejection Appellant respectfully submits that claim 1 is not obvious under 35 U.S.C. §103, and is patentable over the proposed combination of *Wagner* and *Lynch*.

VII(B)4. Claim 10 is not obvious under 35 USC §103 and is patentable over *Wagner et al.* in view of *Lynch et al.*.

Claim 10 is not obvious under 35 U.S.C. §103, and is patentable over the proposed combination of *Wagner* and *Lynch* because the proposed combination fails to disclose every element recited in claim 10. Claim 10 is a system claim that

generally corresponds to claim 1. The Official Action of March 7, 2007 rejects independent claim 10 for the same reasons set forth regarding claim 1, incorporating the reasons therefore in a common, combination rejection.

Appellant respectfully submits that claim 10 is patentable over *Wagner* in view of *Lynch* for the identical reasons that claim 1 is patentable over *Wagner* in view of *Lynch*. Specifically, the proposed combination of *Wagner* and *Lynch* fails to meet the recited claim limitations of "circuitry for accepting user input specifying at least one constraint cost for the defined at least one interaction…" or "circuitry for calculating at least one constraint cost value corresponding, respectively, to the at least one constraint cost…" and "circuitry for automatically assigning the labels of the at least two buttons among the two or more buttons on one or more displayed pages such that the at least one constraint cost is substantially optimized and the at least one constraint cost value is indicative of a relative optimization of the at least one constraint cost..."

In view of the forgoing deficiencies in the Examiner's rejection Appellant respectfully submits that claim 10 is not obvious under 35 U.S.C. §103, and is patentable over the proposed combination of *Wagner* and *Lynch*.

VII(B)5. Claim 19 is not obvious under 35 USC §103 and is patentable over *Wagner et al.* in view of *Lynch et al.*.

Claim 19 is not obvious under 35 U.S.C. §103, and is patentable over the

proposed combination of *Wagner* and *Lynch* because the proposed combination fails to disclose every element recited in claim 19. Claim 19 is a system claims that generally corresponds to claim 1. The Official Actions of March 7, 2007 rejects independent claim 19 for the same reasons set forth regarding claim 1, incorporating the reasons therefore in a common, combination rejection.

Appellant respectfully submits that claim 19 is patentable over *Wagner* in view of *Lynch* for the identical reasons that claims 1, and 10 are patentable over *Wagner* in view of Lynch. Specifically, the proposed combination of *Wagner* and *Lynch* fails to meet the recited claim limitations of "means for accepting user input specifying at least one constraint cost for the defined at least one interaction" or "means for calculating at least one constraint cost value corresponding, respectively, to the at least one constraint cost" and "means for automatically assigning the labels of the at least two buttons among the two or more buttons on one or more displayed pages such that the at least one constraint cost is substantially optimized and the at least one constraint cost value is indicative of a relative optimization of the at least one constraint cost."

In view of the forgoing deficiencies in the Examiner's rejection Appellant respectfully submits that claim 19 is not obvious under 35 U.S.C. §103, and is patentable over the proposed combination of *Wagner* and *Lynch*.

VII(B)6. Claim 28 is not obvious under 35 USC §103 and is patentable over *Wagner et al.* in view of *Lynch et al.*.

Claim 28 is not obvious under 35 U.S.C. §103, and is patentable over the proposed combination of *Wagner* and *Lynch* because the proposed combination fails to disclose every element recited in claim 28. Claim 28 is a computer program product claim that generally corresponds to claim 1. The Official Actions of March 7, 2007 rejects independent claim 28 for the same reasons set forth regarding claim 1, incorporating the reasons therefore in a common, combination rejection.

Appellant respectfully submits that claim 28 is patentable over *Wagner* in view of *Lynch* for the identical reasons that claims 1, 10 and 19 are patentable over *Wagner* in view of Lynch. Specifically, the proposed combination of *Wagner* and *Lynch* fails to meet the recited claim limitations of a computer readable program that when executed on a computer causes the computer to "accept user input specifying at least one constraint cost for the defined at least one interaction" or "calculate at least one constraint cost value corresponding, respectively, to the at least one constraint cost" and "automatically assigning the labels of the at least two buttons among the two or more buttons on one or more displayed pages such that the at least one constraint cost is substantially optimized and the at least one constraint cost value is indicative of a relative optimization of the at least one constraint cost."

In view of the forgoing deficiencies in the Examiner's rejection Appellant respectfully submits that claim 28 is not obvious under 35 U.S.C. §103, and is patentable over the proposed combination of *Wagner* and *Lynch*.

VII(B)7. Dependent claims 2-5, 8, 11-14, 17, 20-23, 26 are not obvious

under 35 USC §103 and are patentable over *Wagner et al.* in view of *Lynch et al.*.

Dependent claims 2-5, 8, 11-14, 17, 20-23, 26 are not obvious under 35 USC §103 and are patentable over *Wagner et al.* in view of *Lynch et al.*. It is well settled law that if an independent claim is nonobvious Under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *See* In re Fine, 837 F.2d 1071. 5 USPQ2d 1596 (Fed. Cir. 1988).

Claims 2-5, 8, 11-14, 17, 20-23, 26 each depend from independent claims 1, 10, or 19 and will therefore stand and fall with their respective parent claim.

VII(B)8. Dependent claims 6-7, 15-16, and 24-25 are not obvious under 35 USC §103 and are patentable over *Wagner et al.* in view of *Lynch et al.*, further in view of *Ikemoto*.

Dependent claims 6-7, 15-16, and 24-25 are not obvious under 35 USC §103 and are patentable over *Wagner et al.* in view of *Lynch et al.*, further in view of *Ikemoto*. It is well settled law that if an independent claim is nonobvious Under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *See* In re Fine, 837 F.2d 1071. 5 USPQ2d 1596 (Fed. Cir. 1988).

The Examiner doesn't attempt to rely on *Ikemoto* to disclose the recited claim limitations that the base combination of *Wagner* and *Lynch* fail to meet, therefore the addition of *Ikemoto* reference has no effect on the failure of the base combination of *Wagner* and *Lynch* to meet each of the recited limitations of the

independent claims incorporated into claims 6-7, 15-16, and 24-25 that depend thereform.

Specifically, the combination of *Wagner et al.* in view of *Lynch et al.*, further in view of *Ikemoto* fails to meet the recited claim limitations of "accepting user input specifying at least one constraint cost for the defined at least one interaction" or "calculating at least one constraint cost value corresponding, respectively, to the at least one constraint cost; and automatically assigning the labels of the at least two buttons among the two or more buttons on one or more displayed pages such that the at least one constraint cost is substantially optimized and the at least one constraint cost value is indicative of a relative optimization of the at least one constraint cost."

In view of the forgoing deficiencies in the Examiner's rejection Appellant respectfully submits that claims 6-7, 15-16, and 24-25 28 are not obvious under 35 U.S.C. §103, and is patentable over the proposed combination of *Wagner*, *Lynch and Ikemoto.*

VIII. CONCLUSION

For the reasons stated above, reversal of the rejections under 35 U.S.C. §101 and 35 U.S.C. §103 is earnestly solicited.

Respectfully Submitted

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APPENDIX A
CLAIMS ON APPEAL

1. A method comprising:

accepting user input specifying a geometrical arrangement of two or more buttons on one or more displayed pages;

accepting user input labeling at least two of the two or more buttons on the one or more displayed pages;

accepting user input defining at least one interaction between the labeled at least two buttons;

accepting user input specifying at least one constraint cost for the defined at least one interaction;

calculating at least one constraint cost value corresponding, respectively, to the at least one constraint cost; and

automatically assigning the labels of the at least two buttons among the two or more buttons on one or more displayed pages such that the at least one constraint cost is substantially optimized and the at least one constraint cost value is indicative of a relative optimization of the at least one constraint cost.

2. The method of Claim 1, wherein said accepting user input specifying a geometrical arrangement of two or more buttons on one or more displayed pages further comprises:

accepting user input specifying one or more sizes of the one or more displayed pages.

3. The method of Claim 1, wherein said accepting user input specifying a geometrical arrangement of two or more buttons on one or more displayed pages further comprises:

accepting user input specifying two or more locations of the two or more buttons on the one or more displayed pages.

4. The method of Claim 1, wherein said accepting user input labeling at least two of the two or more buttons on the one or more displayed pages further comprises:

accepting user input labeling at least two buttons on a first displayed page presented to a user.

5. The method of Claim 1, wherein said accepting user input labeling at least two of the two or more buttons on the one or more displayed pages further comprises:

accepting user input labeling at least one button on a first displayed page presented to a user; and

accepting user input labeling at least one button on a second displayed page presented to the user.

6. The method of Claim 1, wherein said accepting user input defining at least one interaction between the labeled at least two buttons further comprises:

accepting user input identifying at least one relationship between the labeled at least two buttons, said relationship selected from a relationship group including a Fitts'-movement interaction, a Euclidean-distance interaction, a City-Block-distance interaction, an X-directed interaction, and a Y-directed interaction.

7. The method of Claim 1, wherein said accepting user input specifying at least one constraint cost for the defined at least one interaction further comprises:

accepting user input specifying at least one constraint cost for the defined at least one interaction, said at least one constraint cost selected from a constraint-cost group including a global-difficulty cost, a pages-to-close-buttons cost, a pages-to-fixed buttons cost, a path-difficulty cost, a pages-to-far buttons cost, and a parent-to-child variability cost.

8. The method of Claim 1, wherein said accepting user input specifying at least one constraint cost for the defined at least one interaction further comprises:

accepting user input specifying at least one weighting factor to be associated with the specified at least one constraint cost.

9. The method of Claim 1, wherein said assigning the labels of the labeled at least two buttons among the two or more buttons on one or more displayed pages such that the at least one constraint cost is substantially optimized further comprises:

assigning at least one label of the labeled at least two buttons among the two or more buttons on the one or more displayed pages on the basis of an optimization procedure selected from an optimization-procedure group including a gradient descent substantial optimization procedure and a simulated annealing substantial optimization procedure.

10. A system comprising:

circuitry for accepting user input specifying a geometrical arrangement of

two or more buttons on one or more displayed pages, said circuitry selected from an electrical-circuitry group including electrical circuitry having at least one discrete electrical circuit, electrical circuitry having at least one integrated circuit, electrical circuitry having at least one application specific integrated circuit, electrical circuitry forming a general purpose computing device configured by a computer program, electrical circuitry forming a memory device, and electrical circuitry forming a communications device;

circuitry for accepting user input labeling at least two of the two or more buttons on the one or more displayed pages, said circuitry selected from an electrical-circuitry group including electrical circuitry having at least one discrete electrical circuit, electrical circuitry having at least one integrated circuit, electrical circuitry having at least one application specific integrated circuit, electrical circuitry forming a general purpose computing device configured by a computer program, electrical circuitry forming a memory device, and electrical circuitry forming a communications device;

circuitry for accepting user input defining at least one interaction between the labeled at least two buttons, said circuitry selected from an electrical-circuitry group including electrical circuitry having at least one discrete electrical circuit, electrical circuitry having at least one integrated circuit, electrical circuitry having at least one application specific integrated circuit, electrical circuitry forming a general purpose computing device configured by a computer program, electrical circuitry forming a memory device, and electrical circuitry forming a communications device;

circuitry for accepting user input specifying at least one constraint cost for the defined at least one interaction, said circuitry selected from an electrical-circuitry group including electrical circuitry having at least one discrete electrical circuit, electrical circuitry having at least one integrated circuit, electrical circuitry having at least one application specific integrated circuit, electrical circuitry forming

a general purpose computing device configured by a computer program, electrical circuitry forming a memory device, and electrical circuitry forming a communications device;

circuitry for calculating at least one constraint cost value corresponding, respectively, to the at least one constraint cost, said circuitry selected from an electrical-circuitry group including electrical circuitry having at least one discrete electrical circuit, electrical circuitry having at least one integrated circuit, electrical circuitry having at least one application specific integrated circuit, electrical circuitry forming a general purpose computing device configured by a computer program, electrical circuitry forming a memory device, and electrical circuitry forming a communications device; and

circuitry for automatically assigning the labels of the at least two buttons among the two or more buttons on one or more displayed pages such that the at least one constraint cost is substantially optimized and the at least one constraint cost value is indicative of a relative optimization of the at least one constraint cost, said circuitry selected from an electrical-circuitry group including electrical circuitry having at least one discrete electrical circuit, electrical circuitry having at least one integrated circuit, electrical circuitry having at least one application specific integrated circuit, electrical circuitry forming a general purpose computing device configured by a computer program, electrical circuitry forming a memory device, and electrical circuitry forming a communications device.

11. The system of Claim 10, wherein said circuitry for accepting user input specifying a geometrical arrangement of two or more buttons on one or more displayed pages further comprises:

circuitry for accepting user input specifying one or more sizes of the one or more displayed pages.

12. The system of Claim 10, wherein said circuitry for accepting user input specifying a geometrical arrangement of two or more buttons on one or more displayed pages further comprises:

circuitry for accepting user input specifying two or more locations of the two or more buttons on the one or more displayed pages.

13. The system of Claim 10, wherein said circuitry for accepting user input labeling at least two of the two or more buttons on the one or more displayed pages further comprises:

circuitry for accepting user input labeling at least two buttons on a first displayed page presented to a user.

14. The system of Claim 10, wherein said circuitry for accepting user input labeling at least two of the two or more buttons on the one or more displayed pages further comprises:

circuitry for accepting user input labeling at least one button on a first displayed page presented to a user; and

circuitry for accepting user input labeling at least one button on a second displayed page presented to the user.

15. The system of Claim 10, wherein said circuitry for accepting user input defining at least one interaction between the labeled at least two buttons further comprises:

circuitry for accepting user input identifying at least one relationship between the labeled at least two buttons, said relationship selected from a relationship group including a Fitts'-movement interaction, a Euclidean-distance interaction, a City-Block-distance interaction, an X-directed interaction, and a Y-directed interaction.

16. The system of Claim 10, wherein said circuitry for accepting user input specifying at least one constraint cost for the defined at least one interaction further comprises:

circuitry for accepting user input specifying at least one constraint cost for the defined at least one interaction, said at least one constraint cost selected from a constraint-cost group including a global-difficulty cost, a pages-to-close-buttons cost, a pages-to-fixed buttons cost, a path-difficulty cost, a pages-to-far buttons cost, and a parent-to-child variability cost.

17. The system of Claim 10, wherein said circuitry for accepting user input specifying at least one constraint cost for the defined at least one interaction further comprises:

circuitry for accepting user input specifying at least one weighting factor to be associated with the specified at least one constraint cost.

18. The system of Claim 10, wherein said circuitry for assigning the labels of the labeled at least two buttons among the two or more buttons on one or more displayed pages such that the at least one constraint cost is substantially optimized further comprises:

circuitry for assigning at least one label of the labeled at least two buttons among the two or more buttons on the one or more displayed pages on the basis of an optimization procedure selected from an optimization-procedure group including a gradient descent substantial optimization procedure and a simulated annealing substantial optimization procedure.

19. A system comprising:

means for accepting user input specifying a geometrical arrangement of two or more buttons on one or more displayed pages;

means for accepting user input labeling at least two of the two or more buttons on the one or more displayed pages;

means for accepting user input defining at least one interaction between the labeled at least two buttons;

means for accepting user input specifying at least one constraint cost for the defined at least one interaction;

means for calculating at least one constraint cost value corresponding, respectively, to the at least one constraint cost and

means for automatically assigning the labels of the at least two buttons among the two or more buttons on one or more displayed pages such that the at least one constraint cost is substantially optimized and the at least one constraint cost value is indicative of a relative optimization of the at least one constraint cost.

20. The system of Claim 19, wherein said means for accepting user input specifying a geometrical arrangement of two or more buttons on one or more displayed pages further comprises:

means for accepting user input specifying one or more sizes of the one or more displayed pages.

21. The system of Claim 19, wherein said means for accepting user input specifying a geometrical arrangement of two or more buttons on one or more displayed pages further comprises:

means for accepting user input specifying two or more locations of the two or more buttons on the one or more displayed pages.

22. The system of Claim 19, wherein said means for accepting user input labeling at least two of the two or more buttons on the one or more displayed pages further comprises:

means for accepting user input labeling at least two buttons on a first displayed page presented to a user.

23. The system of Claim 19, wherein said means for accepting user input labeling at least two of the two or more buttons on the one or more displayed pages further comprises:

means for accepting user input labeling at least one button on a first displayed page presented to a user; and

means for accepting user input labeling at least one button on a second displayed page presented to the user.

24. The system of Claim 19, wherein said means for accepting user input defining at least one interaction between the labeled at least two buttons further comprises:

means for accepting user input identifying at least one relationship between the labeled at least two buttons, said relationship selected from a relationship group including a Fitts'-movement interaction, a Euclidean-distance interaction, a City-Block-distance interaction, an X-directed interaction, and a Y-directed interaction.

25. The system of Claim 19, wherein said means for accepting user input specifying at least one constraint cost for the defined at least one interaction further comprises:

means for accepting user input specifying at least one constraint cost for the defined at least one interaction, said at least one constraint cost selected from a constraint-cost group including a global-difficulty cost, a pages-to-close-buttons cost, a pages-to-fixed buttons cost, a path-difficulty cost, a pages-to-far buttons cost, and a parent-to-child variability cost.

26. The system of Claim 19, wherein said means for accepting user input specifying at least one constraint cost for the defined at least one interaction further comprises:

means for accepting user input specifying at least one weighting factor to be associated with the specified at least one constraint cost.

27. The system of Claim 19, wherein said means for assigning the labels of the labeled at least two buttons among the two or more buttons on one or more displayed pages such that the at least one constraint cost is substantially optimized further comprises:

means for assigning at least one label of the labeled at least two buttons among the two or more buttons on the one or more displayed pages on the basis of an optimization procedure selected from an optimization-procedure group including a gradient descent substantial optimization procedure and a simulated annealing substantial optimization procedure.

28. A computer program product comprising a computer useable medium including a computer readable program, wherein the computer readable program when executed on a computer causes the computer to:

accept user input specifying a geometrical arrangement of two or more buttons on one or more displayed pages;

accept user input labeling at least two of the two or more buttons on the one or more displayed pages;

accept user input defining at least one interaction between the labeled at least two buttons;

accept user input specifying at least one constraint cost for the defined at least one interaction;

calculate at least one constraint cost value corresponding, respectively, to the at least one constraint cost; and

automatically assign the labels of the at least two buttons among the two or more buttons on one or more displayed pages such that the at least one constraint cost is substantially optimized and the at least one constraint cost value is indicative of a relative optimization of the at least one constraint cost.

APPENDIX B
EVIDENCE

None

APPENDIX C
RELATED PROCEEDINGS

None